CLAIMS

1. A particle crushing and sizing apparatus, comprising in a casing: a drive shaft provided horizontally; a plurality of circular plates fixedly supported at intervals by said drive shaft; and stators provided below said circular plates and opposing the peripheral edge plate faces thereof, said stators having inclined faces such that the gap between said stators and the plate faces of said circular plates becomes narrower towards the peripheral edge of the plate faces; wherein the plate faces of said circular plates and the inclined faces of said stators form gap portions where particles are held, and wherein the narrowest gap portions between the peripheral edges of said circular plates and said stators form crushing and sizing portions.

2. A particle crushing and sizing apparatus according to claim 1, wherein said stators comprise inclined faces opposing the plate faces of said respective adjacent circular plates.

3. A particle crushing and sizing apparatus according to claim 1, wherein planar regions parallel to the plate faces of said circular plates are formed on the peripheral edges of the inclined faces of said stators.

4. A particle crushing and sizing apparatus according to claim 3, wherein cutaway portions are formed on the peripheral edges of said stators, with adapters provided in said cutaway portions so as to form planar regions parallel to the plate faces of said circular plates.

5. A particle crushing and sizing apparatus according to claim 4, wherein said adapters are provided in the cutaway portions of said stators via interposed spacers.

6. A particle crushing and sizing apparatus according to claim 1, wherein protrusions are provided on the respective opposing faces of the circular plates and the stators constituting said crushing and sizing portions.

7. A particle crushing and sizing apparatus according to claim 6, wherein the protrusions provided on said respective opposing faces are arranged so that the protrusions provided on one face pass between the protrusions provided on the other face.

8. A particle crushing and sizing apparatus according to claim 1, wherein auxiliary pins are provided on the plate faces of the circular plates forming said gap portions.

9. A particle crushing and sizing apparatus according to claim 8, wherein the auxiliary pins provided on the plate faces of said circular plates have a substantially triangular shape in a plan view with one of the triangle's vertices pointing towards the rotation direction of the circular plates.

10. A particle crushing and sizing apparatus according to claim 1, wherein crushing pins for particle coarse crushing are provided on the inclined faces of said stators and/or the plate faces of said circular plates.

11. A particle crushing and sizing apparatus according to claim 1, wherein a fixed shaft is provided spanning the interior of said casing, such that said stators

are fitted onto said fixed shaft via spacers, and said circular plates are supported, via spacers, by said drive shaft.

12. A particle crushing and sizing apparatus according to claim 1, wherein a particle feeding inlet is formed in the upper central portion of said casing, and particle dispersing means is provided between said particle feeding inlet and said circular plates.

13. A particle crushing and sizing apparatus according to claim 12, wherein said particle dispersing means is constituted by arranging a cone with its tip pointing upward, in the center of said casing.

14. A particle crushing and sizing apparatus according to claim 12, wherein said particle dispersing means comprises a plurality of elongated members spanning said casing in the horizontal direction.